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Docket No.: 00971/000D319-US0
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Anatoly G. Ivanov

Application No.: 08/995,715

Confirmation No.: 8165

Filed: December 22, 1997

Art Unit: 2672

For: METHODS FOR FORMING/RECORDING
IMAGE AND DEVICES FOR SAME

Examiner: J. A. Brier

APPLICANT'S BRIEF ON APPEAL

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the Final Rejection of April 1, 2005 of claims 48, 50, 55-61, 63, 67, 69, 72-73, 75-78, 80 and 81. The Notice of Appeal was filed on August 1, 2005.

This brief is filed within two months of the filing of the Notice of Appeal, October 1, 2005 being a Saturday. The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

(1) REAL PARTY IN INTEREST

The real party in interest for this appeal is the assignee:

The Far-Eastern Technical University of Vlasdivostok, Russian Federation.

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(2) RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(3) STATUS OF CLAIMS

A. Total Number of claims in the application

There are 21 claims pending in application, these being claims 48, 50, 55-61, 63, 67, 69, 71, 73, 75-78, 80 and 81. These claims are presented in Appendix A.

B. Current Status of Claims

All of the claims listed above are on appeal. No claim stands allowed.

Of the claims on appeal, claims 48, 57 and 69 are independent claims.

Claims 50, 55-56, 71, 77-78 and 80 depend from independent claim 48.

Claims 58-61, 67, 73, 75-76 and 81 depend from independent claim 57.

Claim 69 stands alone.

Each of the independent claims is to be treated as a separate invention. The claims depending from independent claims 48 and 57 define further features of the invention of the respective independent claim.

(4) STATUS OF AMENDMENTS

On July 1, 2005, applicant filed an Amendment After Final Rejection. The Examiner responded to the Amendment After Final Rejection in an Advisory Action mailed July 26, 2005, in which he indicated that the proposed amendments to the claims submitted in the Amendment After Final Rejection would be entered for purposes of appeal. Therefore, the claims on appeal that appear in the attached Appendix A are those amended claims presented in the Amendment After Final Rejection.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The discussion below refers to the Substitute Specification submitted on April 4, 2003. This was accepted by the Examiner in the Office Action dated July 1, 2003. The drawings currently of record are the amended set submitted on October 6, 2004. These have been accepted by the Examiner.

The invention is described with respect to the two figures that appear on the following page.¹

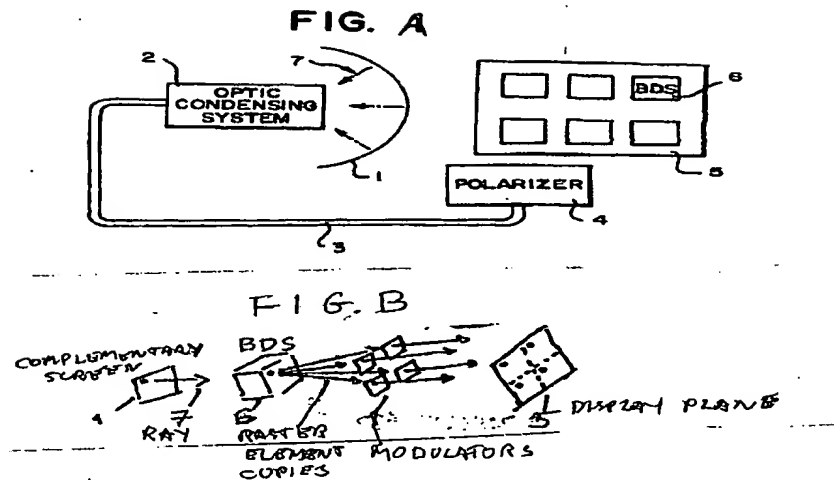
The present invention is directed to an apparatus and method (claims 48, 57) for increasing the resolution of a displayed image and to a holographic display system (claim 69) based on the apparatus of claim 48.

Referring to Fig A (next page), there is a complementary screen 1 of one of light emitting or light source modulating devices, such as LED devices, injection lasers, etc. (page 8, lines 3-5).

The devices of the complementary screen 1 generate a two dimensional (2D) array of light. This 2D array of devices inherently defines a raster of pixels (see page 8, lines 9-11). The three independent claims all call for the two dimensional array to have N pixels.

The raster of N pixels of the complementary screen 1 can be divided into blocks (term used in the Specification, page 8, lines 6-12) or raster elements (term used in the claims). A raster element can be only one pixel. The light emitted by a pixel is shown as a light ray 7 and each light ray 7 is applied through an optical condensing system 2, a light conductor 3 and a polarizer 4 to an element of a matrix 6 of block deflecting system (BDS) elements. The optical condensing system 2 condenses the light rays 7 and is optional. The polarizer 4 also is an optional element used to eliminate light rays that are not to be acted on by the BDS deflecting elements (page 7, lines 11-17 and page 11, lines 6-14).

¹ Fig. A of the following page is the original Fig. 1 of the application and Fig. B is for explanation purposes. The application has undergone a somewhat tortuous prosecution, including a number of amendments made to the Specification and drawings to satisfy objections made by the Examiner.



Multiple copies of each of the raster elements of the complementary screen 1 raster are made by the matrix 6 of block deflecting system elements (page 5, lines 11-15 and page 10, lines 7-9). The multiple copies of the raster element are displayed on an image plane 5² as a totality of M pixels, where $M > N$ (page 10, lines 3-5). This provides the increased resolution.

The BDS matrix 6 is a matrix of discrete type deflectors, e.g., acoustic optical deflectors, electro-optical deflectors, liquid optical deflectors, etc. (page 10, lines 22-23). As set forth (page 12, lines 14-15) "the resolution of the complementary screen is multiplied by the number of deflectors comprising the BDS matrix."

Figs. 2-3 show one embodiment of a BDS deflector element used in the matrix 6 (page 11, line 15 - page 12, line 18). As shown, a light ray 7 (corresponds to a pixel or raster element of the complementary screen 1) is conducted by the optical fiber 3 (Fig. A) to a plurality of acoustic optical deflectors 12. The light ray 7 on the conductor 3 is applied

² The terms "image plane" and "display device" are used more or less interchangeably throughout the Specification. Exhibit A of Appendix B sets forth some of the numerous uses of the terms. It is clear that there is to be a final visual display on the image plane 5.

to each of the deflectors 12. Each light ray 7 (raster element) is applied to its own BDS deflector element in the BDS matrix 6.

In Fig. 2, each acoustic optical deflector 12 has a piezoelectric element 13 to which electric signals are applied such as by using a transistor matrix row and column line address system (page 12, lines 10-13). Actuation of the piezoelectric element 13 of a deflector 12 produces a sound wave 13 that interacts with the light ray 7 in fiber 3. The ray is refracted from each deflector to a light conductor 3'. Each deflector 12 produces a copy of the original raster element, i.e., light ray 7 from the complementary screen 1. If there are P deflectors 12, there would be P copies of the raster element produced.

A focusing cone 11 on the end of each light conductor 3' transforms the size of the image on the conductor to correspond to the size of a block of the image to be displayed on the image plane 5. As shown in Fig. 3, the cones 11 can be of hexagonal shape. The cones 11 themselves can form the image plane 5 by placing a plurality of them together, as shown (page 12, lines 8-9).

A second embodiment of a BDS deflector element for making the copies of the raster elements and that uses parallel scanning of the image plane 5 is shown in Fig. 4(a). Here, each light ray 7 emitted by the complementary screen 1 is passed to a system of partly transparent mirrors (three shown, 12a, 12b, 12c). Each mirror reflects $\frac{1}{3}$ of the light, i.e., makes a copy of the light ray (page 14, line 17 - page 15, line 14).

A third embodiment of a BDS deflector element is shown in Fig. 4(b) (page 15, line 15 - page 16, line 20). Here, each light ray 7 is applied to a lens raster matrix 30 which divides the light ray (multiple copies made) into components corresponding to the number of lenses 23 in the matrix 30 (page 16, lines 3-6).

A fourth embodiment of a BDS deflector element is shown in Fig. 6, which is directed to the holographic aspect of the invention of claim 69 (page 17, line 1 - page 17, line 6). Here, element 22 is a light multiplying matrix (page 17, line 3). Element 31 is a holograph display plane corresponding to the display plane 6 of Fig. A and Fig. 1.

Each copy of the raster element is modulated with information, e.g., video type. As set forth at page 15, line 21 - page 16, line 2, there is an array of light modulators

between the image plane 5 and the BDS matrix 6 in order to independently modulate (gray scale, hue, etc.) the light of each (block) of the P raster element copies. The modulators are not clearly shown in Fig. A (original Fig. 1), where they are considered to be part of the BDS. They are more clearly shown in Fig. 6 as described with respect to the holographic system of Fig. 6 (page 16, lines 12-16, light modulating screen 29; at page 17, line 4; page 18, line 1-page 19, line 9; page 19, line 14 - page 20, line 2).

There can be more than one complementary screen 1 and more than one BDS so that several blocks can be reproduced on the image plane 5 at the same time (page 13, lines 3-12).

The overall operation of the system is shown in Fig. B (above) and is summarized as follows:

The complementary screen 1 forms a raster of a lighted surface. Each generated raster element forms a light ray 7 that is multiplied by the BDS multiplying system into P copy beams. Each beam copy forms a raster element of a block of an image that is displayed on the display plane 5. Each block on the display plane comprises its unique image fragment. To make the fragments differ from block to block, each copy beam is modulated independently, according to the image information for its block. The image information for all the blocks is supplied to an array of modulators. The image is formed by P blocks, positioned on the display surface 5 one by one as tiles. The positioning of the blocks is clearly shown on Fig. A (above).

The independent apparatus and method claims 48 and 57 are directed to the above. The independent apparatus claim 69 is based on the apparatus of claim 48, refers to Fig. 6, and further calls for a coherent light source for producing a 3D holographic image from the display screen 31 surface.

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Are claims 48, 57, 59, 60, 61, 75, 76, 77, 78, 80 and 81 properly rejected under 35 U.S.C. §102 as being anticipated by Lindenblad, U.S. 2,686,219?

Are claims 50, 55, 56, 58, 67, 69, 71 and 73 properly rejected under 35 U.S.C. §103 as being obvious over the combination of Lindenblad in view of Ezra, et al., U.S. 5,666,226? [emphasis added to show the independent claims]

(7) **ARGUMENT**

A. The Prior Art

The principal reference relied on in rejecting all of the claims is Lindenblad, U.S. 2,686,219.

This patent dates back to the late 1940's or 1950's when the FCC was deciding between adopting as a standard one of the color television systems of CBS or RCA. CBS' color system (field sequential) used a wheel (disk) with three color filters (R, G, B) that was rotated in front of a monochrome pick-up tube at the transmitter. A synchronized R, G, B color wheel was rotated in front of a monochrome display tube at the receiver. RCA's system (dot sequential), used three pickup tubes, one for each color R, G, B.

The object of Lindenblad was to make an electronic version of the CBS mechanical rotating color wheel system. The Lindenblad system is described below.

Transmitter (Fig. 1). The object (image) is picked up by an optical system (lens) 10.

The optical image is split by an optical splitter 11 into three light paths. Mirrors 15a, 15b are mechanically adjusted by knobs 16a, 16b to accurately position each of the three light paths from splitter 11 onto a respective color (R, G, B) filter 12a, 12b, 12c. Each of the color filters 12a, 12b, 12c separately positions its color light component (R, G, B) onto a respective "light modulator" 13a, 13b, 13c (detailed in Fig. 2). The light modulators 13a, 13b, 13c are turned on and off in sequence (column 5, lines 14-26) by a keying voltage from a keyer 24. That is, two of the light modulators 13a, 13b, 13c are always off.

The generic light modulator 13 is described referring to Fig. 2 (column 5, line 35-column 6, line 45) and all of the light modulators 13a, 13b, 13c are of the same configuration. As described, the light of the respective color light component (R, G or B)

impinges on a photo-emissive input screen 30 which emits electrons that impinge on a secondary emissive screen 33 and then on a phosphorescent (light) output screen 31. Since the modulators (Fig. 2) 13a, 13b, 13c are keyed on sequentially, the output screen 31 of each modulator 13a, 13b, 13c sequentially produces monochromatic (black and white) light corresponding to a respective received one of the three R, G or B color light components.

The monochromatic output light from screen 31 of each modulator 13a, 13b, 13c is sequentially input to a light converger 18 (a lens) whose output is to a monochromatic pickup tube (iconoscope) 23. That is, the three separate components, or fields, (R, G, B) of the same image are sequentially imaged onto the pick-up tube 23. The pick-up tube 23 scans each color component image line-by-line. The electrical video signal output of pickup tube 23 is that of three sequential and distinct color fields (color light components) R, G, B. This is the equivalent of the three color fields produced by the CBS color wheel.

Receiver (Fig. 3). There is a monochromatic display tube 41 (column 7, line 22) that receives the video signal from the transmitter pickup tube 23. The received video signal is sequential and of three separate fields, i.e., the three color light components R, G and B. A light splitter (no number) receives the monochromatic light output from the display tube 41 and splits it into three paths (monochromatic - not color). The light of each path is applied to a respective light modulator 13d, 13e, 13f. Each of the receiver light modulators 13d, 13e, 13f is a slight variation of the generic transmitter light modulators 13a, 13b, 13c of Fig. 2. That is, each of the received modulators 13d, 13e, 13f has a different type phosphor for its output screen 31 (column 6, line 71-column 7, line 22) to produce a light output of a different color (a color light component of the original image).

The receiver (Fig. 3) light modulators 13d, 13e, 13f are keyed on sequentially and in synchronism with the keying of the transmitter light modulators 13a, 13b, 13c (column 7, lines 27-35). Note that two of the receiver modulators 13d, 13e, 13f are off at any one time and block light transmission. This is the equivalent of the CBS color wheel at the receiver.

The receiving light modulators 13d, 13e, 13f sequentially output the three color light components (or fields) of the original image. These color light components (red, blue and green) are conveyed to a light converger 18a (lens). The three color light components (one field of each color R, G, B) are sequentially viewed by the human eye, or eyes.

There is no physical display screen, such as a color CRT, to display the R, G and B color light components produced by the receiver light modulators 13d, 13e, 13f. Persistence of the eye retina seems to be relied on to merge the sequentially formed R, G, B color light components back into the original color image. While one eye is shown in the drawings, applicant admits that a normal human has two eyes. But two eyes still do not form a display. As is well known, the photoreceptors of the eye retina convert received light images into electrical signals that activate the brain.³ There is no display such as the display plane 5 of the invention.

Summary of the Main Differences Between Invention and Lindenblad

The invention multiplies each of the raster elements (one or more pixels) of the original raster of N pixels of the complementary screen 1 by P times. The copies of the multiplication are modulated and then displayed on the display plane 5 surface in blocks totaling M pixels, where M is greater than N. This increases the resolution.

Lindenblad at the transmitter (Fig. 1) divides the original image into three color light components R, G, B. At the receiver (Fig. 3) the three color light components, or different color fields, are re-assembled in sequence back into the original image directly in the eye(s) of the human observer. There is no increase in resolution. That is, what is seen by the human eyes is only the same object originally input to the transmitter lens 10.

There is no image display screen or plane on which the image is assembled. The eye is not a display screen surface. The definition of "Display" is to show.⁴

³ Reference is made to Exhibit B of Appendix B.

⁴ Reference is made to Exhibit C of Appendix B.

The language of the claims here on appeal is discussed in Section B. The Examiner's position as set forth in the Advisory Action of July 26, 2005 is considered in Section C.

B. The Claims Clearly Distinguish In Structure and Function Over Lindenblad.

The independent claims 48, 57 and 69 are now discussed relative to Lindenblad. As demonstrated above, the object, structure and result of the subject invention and Lindenblad are completely different. As is also demonstrated below, Lindenblad lacks many of the claimed features. Applicant respectfully contends that the claims patentably distinguish over the cited art applied using either the standard of applying a dictionary definition or referring to the words as used in the Specification.

It is noted that for an anticipation rejection to be supported, "... the reference must teach every aspect of the claimed invention either explicitly or implicitly". MPEP 706.02(A)IV, pages 700-21. The Examiner's §102 rejection does not meet this basic requirement.

1. Lindenblad does not have a complementary screen.

Each of the independent claims 48 and 69 (clause a) sets forth at least one complementary screen (the screen 1 of Fig. A and Fig. 1) of light emitting or light source modulating devices that produce a two dimensional array of N pixels from which array (raster) of pixels a plurality of raster elements are generated. Method claim 57 calls for a complementary screen having a two dimensional array of pixels and generating a plurality of raster elements from the pixels. That is, the two dimensional raster is inherently divided into or formed by a plurality of raster elements. Each of the raster elements can be of one or more pixels.

Neither of Lindenblad's optical system 10 (Fig. 1) and/or light splitter 11 is a "complementary screen" of light emitting or light source modulating devices. Lindenblad's elements 10 and 11 are only passive optical elements that are not, as clearly set forth in each of claims 48 and 69, a complementary screen that is one of light emitting or light source modulator elements so as to generate a raster of pixels. Lindenblad also does not

generate a plurality of raster elements from a two dimensional array of pixels, as in claim 57. Lindenblad only receives an image at his lens 10.

2. Lindenblad does not have a raster multiplying system.

Each of independent claims 48, 57 and 69 (clause (b)) also clearly recites a raster multiplying system which operates by making multiple copies of each of the raster elements of the original 2D raster of the (one or more) complementary screen 1. This is the matrix of BDS elements of Figs. 2-3, 4(a), 4(b) and 6. Each BDS element makes multiple copies of each of the raster elements by dividing a light ray into components.

In Lindenblad, the original image viewed by the optical system 10 is not treated in terms of raster elements, i.e., a part of an original 2D array of pixels. As explained above, Lindenblad has no physical raster that is produced by a complementary screen. He operates by viewing an original image and dividing this into, or extracting from it, its color light components R, G, B. Lindenblad's transmitter only ends up with three separate and different and lesser content versions (R, G, B color light components) of the original (full color) image. There clearly is no multiplication of any pixel or raster element. No copies are made.

3. Lindenblad does not have any element that corresponds to the modulators of the raster element copies.

Clause (c) of each of the independent claims 48, 57 and 63 recites the independent modulation of each of the P blocks formed by the copies of the raster elements. The modulator, e.g., 29 of Fig. 6, is a light modulator that adds a component such as gray scale or color to each of the copies of each of the raster elements (light rays).

While Lindenblad's transmitter has "light modulators" 13a, 13b, 13c, each one only produces a monochromatic light output version of the respective received R, G, B color light component of the original image. There really is no "modulation" of the light that is input to the "modulator".

Independent claim 48 further recites an array of these modulators with each modulator independently modulating the raster elements of one block "separately and simultaneously". In Lindenblad, the light modulator 13a - 13f cannot perform these

functions. They are operated sequentially and not simultaneously. Two of Lindenblad's three modulators at both the transmitter and the receiver are always off.

4. The Eye is not the same as or even the equivalent of a display plane or surface.

Each of claims 48 and 57 calls for a single image display surface on which the P image blocks of a total of M pixels are displayed where M is greater than the original number of pixels N generated by the complementary screen 1. Claim 69 calls for a single surface on which holographic blocks of M pixels are formed and (clause (c)) producing a 3D holographic image from the surface.

In Lindenblad, there is no surface or image plane or display device, such as a CRT, or other type of display plane on which an image is displayed, yet alone one on which an image is displayed that has a multiplication of the N pixels of the original raster. As explained above, the ordinary dictionary definition of "display" is to show. Exhibit A of Appendix B lists various parts of the Specification which clearly demonstrates this.

On the output/receiver side of Lindenblad, Fig. 3, the three color components pass in sequence, through the "light converger" 18a to the viewer's eyes. The "convergence" is not an assembly of the three color light components in one place to display the three color components of the original transmitted image. Converger 18a only sequentially directs the three color light components onto the eyes for viewing. Nothing in Lindenblad corresponds to a surface or plane on which there is a display of the P blocks as set forth in claims 48 and 53 or a surface on which all of the P blocks "are formed" as in claim 69.

Claims 48, clause (d) and 57 use the term "single image display surface". The term "image display surface" appears in clause (e) of claim 57. The word "single" is used to more clearly distinguish over the three light modulators 13d, 13e, 13f of Lindenblad's receiver where at the output of each one, one of the color light components sequentially and separately appears.

5. Lindenblad Does Not Multiply Pixels

Each of the independent claims 48, 57 and 69 also sets forth that the number of pixels in the P image blocks of the image display (surface) is M, which is greater than the

number N of pixels in the original raster on the complementary screen 1. This clearly shows a multiplication of the original number of N pixels. There is nothing in Lindenblad that teaches or even remotely suggests multiplication of the number of pixels. Lindenblad starts with picking up an image at the transmitter and presenting the same image to the eye(s) for viewing.

6. The holographic image display system of claim 69 is not present in the combination of Lindenblad and Ezra.

Claim 69 has the features discussed above that are not shown in the principal reference to Lindenblad. Claim 69 further recites in clause (e) a coherent light source for producing a 3D (three dimensional) holographic image for the display surface on which the blocks are displayed. The Ezra patent, when added to support the rejection of claim 69, does not overcome the basic deficiencies of the principal reference to Lindenblad.

7. The §103 Rejection Is of No Consequence

The §103 rejection adds the Ezra patent to Lindenblad. The grounds of rejection of independent claim 69, the holographic system, based on the combination is not really specified. Also, other claims, such as 50, 55, 56, 58, 67, 71 and 73, that depend from independent claims 48 and 57 rejected on the combination are of disparate subject matter. For example, claims 50 and 55 each recite a plurality of the complementary screens.

Whatever the reason for the combination of the references, it still does not cure the basic defect of Lindenblad so as to meet the basic subject matter of the independent claims 48, 57 and 69. Therefore, the §103 rejection also fails.

8. Summary of Argument.

As demonstrated above, the three independent claims of the application clearly differ in concept, intent, structure and function from that of Lindenblad. Therefore, the principal reference clearly fails to support a §102 rejection and to be the foundation of the §103 rejection. Again, the invention multiplies the N pixels of the original raster and displays the result of M pixels, where $M > N$. Lindenblad dissects the original image into

three color light components and sequentially presents the same three color light components to the eyes to reproduce only the original image.

C. Response to Examiner's Position

In the Advisory Action dated August 4, 2005, the Examiner presents the principal points of his position. Applicant quotes and then respectfully refutes each of these.

1. Applicant has not provided any means that will convert the resolution of the input image into a resolution greater than the input.

This clearly is not correct. As described above and as claimed, the complementary screen 1 has N pixels and the display plane surface 5 has M pixels where M is greater than N. (See pages 8, line 9 - page 9, line 17 and page 17, lines 7-22 for numerical examples.)

The several embodiments of the light ray (pixel) multiplying system (BDS) element for each light ray is described above with respect to each of Figs. 2, 3, 4(a), 4(b) and 6. Each deflector element of the BDS matrix makes a plurality of copies of a raster element. All of the copies are displayed on the image plane 5. Since there are finally M pixels, and since $M > N$, the resolution on the display plane 5 is increased.

2. Lindenblad like applicant receives an input image of a number of pixels and produces on a display screen the same number of pixels. The multiplication occurs inside the display system by multiplying the pixels of the display device (claimed complementary screen) over time into the pixels of the input image signal since the display device has less pixels than the input image signal. Thus, applicant's and Lindenblad's display systems are very similar. [parenthesis added]

As to the first sentence, it is incorrect. Applicant's system does not produce the same number (N) of pixels received from the complementary screen 1 on the output display screen 5. It produces M pixels, which is a multiplication of the original number of N pixels on the display screen.

Also, while Lindenblad may produce an output having the same number of pixels as the input, he has no display screen. The definition of "display" is to hold up to

view or to provide on a screen (Exhibits A and C of Appendix B). The display device in the present invention is the (output) display plane 5. It is the claimed complementary screen 1 which is the input.

The second sentence is not understood. The final display plane 5 has more pixels (M) and not less pixels than the input number (N) originally present on the complementary screen 1.

Lindenblad inputs a color image to his transmitter and outputs to the eye for viewing the same image. This is no multiplication.

As to the last sentence, the broad unsupported assertion that applicant's claimed display system and Lindenblad's system are "very similar", which they clearly are not for the reasons discussed above, does not support a §102 anticipation rejection.

3. Each path (red, green and blue) in Lindenblad is independently modulated in order to selectively generate a red, a green or a blue image. Over time the monochrome display is multiplied to have 3 times the number of pixels forming red, green and blue pixels by the selective modulation of the red, green and blue modulators.

As to the first sentence, Lindenblad's so-called "light modulators" 13a, 13b, 13c do not really modulate anything. They only convert a received light signal to an electronic signal. Also, the final result imaged on the eye(s) is only the same image seen by the transmitter input lens 10.

The Examiner's logic regarding multiplication of pixels appears to be incorrect. How can Lindenblad end up with the eye(s) viewing the identical image seen by the transmitter lens 10 and there be a multiplication of pixels?

4. Applicants 12/22/1997 specification at pages 11, 14, 15 and 19 makes reference to image plane 5 and page 19 makes reference to display screen 5. Applicant does not specify any particular image plane or display screen, thus, applicants specification is using any prior art image plane or display screen to form the P blocks into a single image which is fully met by Lindenblad by at least the eye of the user which has an image forming surface such as the retina.

Claims 48 and 57 recite a single display surface and claim 69 a single surface on which the image is formed and the production of a 3D holographic image from the surface. Exhibit A of Appendix B sets forth some of the numerous instances which describe the display plane 5.

The Specification also describes a number of types of display surfaces. For example, there can be a special fluorescent covering of the image plane to transform coherent light into non-coherent dispersed light (page 10, lines 13-15). A liquid crystal image transformer may be used as an image plane for forming the entire image on the image plane 5 block by block (page 10, lines 16-21). The cones 11 of the BDS 6 of Fig. 3 can comprise the image plane for the complete image (page 10, lines 8-13). The image plane can be two separate photosensitive layers (page 13, line 21 - page 14, line 8); a hologram forming plane which is a layer of photochrome material sensitive to complementary screen 1 emitted light (page 18, lines 12-14) to produce a 3D image that can be viewed directly or projected onto a large screen. All of these devices all display an image for viewing by the eye.

The Examiner considers the retina of the eye to be an image forming surface. But he neglects the display attribute and function of the claim. For the eye(s) to be able to display is physically impossible. The purpose of the (an) eye is to see or view, and not to display. The dictionary definition of the eye is a lens focusing incident light on an internal photosensitive retina from which nerve impulses are sent to the brain. See attached Exhibit C of Appendix B. The retina is only a receptor of light and not a display surface.

Example: the eye of person #1 views the Lindenblad output image. Person #2 cannot see the image viewed by the eyes of person #1.

5. The proposed amendment to limit the surface to a single image display surface is met by Lindenblad because the figures show one

eye while most users have two functioning eyes thus the patent teaches to one of ordinary skill in the art both one eye and two eyes.⁵

Applicant agrees that a person viewing the Lindenblad output image would do so using two eyes. But the claimed single image display surface is not met by the photosensitive receptors of the eye retina. The eye(s) just do not display anything.

D. Conclusion

The three independent claims of the application clearly differ in concept, intent, structure and function from that of Lindenblad. Therefore, the principal reference to Lindenblad clearly fails to support the §102 anticipation rejection and to be the foundation of the §103 obviousness rejection. The claims that depend from the independent claims add further features not shown or suggested by either of the references.

Accordingly, all of the claims are patentable and should be allowed.

(8) CLAIMS

A copy of the claims on appeal is attached hereto as Appendix A.

(9) EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

Appendix B with Exhibits A, B and C is attached.

⁵ During a telephone interview held with the Examiner on June 24, 2005, it was discussed that Lindenblad's receiver light modulators 13d, 13e, 13f might be considered a surface on which an image is displayed. It is again noted that the display plane 5 of the invention displays multiple copies of the original raster on screen 1. Applicant does not agree with this. In Lindenblad, each of these modulators can at best display only a part, that is, one color component, of the original image. To make it abundantly clear that applicant's display plane 5 is not the same as Lindenblad's three light modulators 13d, 13e, 13f, claims 48, 57 and 69 were amended.

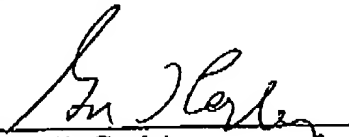
(10) RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

It is respectfully requested that the Examiner's rejection of the Final Rejection be REVERSED.

Dated: October 3, 2005

Respectfully submitted,

By 

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 08/995,715

Claims 1-47. Canceled.

48. (Currently amended) An image display system comprising:

(a) at least one complementary screen of one of light emitting or light source modulating devices producing light in a two dimensional array of N (a real number) pixels, from which array of pixels a plurality of raster elements are generated;

(b) a raster multiplying system comprising an array of optically inter-related light dividing elements, each said light dividing element to divide the light of said plurality of raster elements of the complementary screen into parts, a first section of said array arranged to directly receive light from said complementary screen, a part of which directly received light is passed to at least one other section of said array, the light directly received by said first section of said array and the light passed to said at least one other section of said array divided into components to form copies of the raster elements, with said copies of said raster elements forming corresponding raster elements in P blocks, each block of said P blocks generally comprising a two dimensional array of said raster element copies;

(c) an array of controllable modulators located after said raster multiplying system, each modulator of said array to independently modulate the raster elements of one of said P blocks so that light in each block is modulated separately and simultaneously; and

(d) a single image display surface on which said P image blocks of a total number of M pixels are formed and displayed, where the number M exceeds the number N and where said surface preceding components of (a), (b) and (c) are placed in the mentioned order of the light path of the complementary screen.

Claim 49. Canceled.

50. (Previously presented) A system as in claim 48, further comprising a plurality of said complementary screens.

Claims 51-54. Canceled.

55. (Previously presented) A system as in claim 71 further comprising a plurality of said complementary screens.

56. (Previously presented) A system as in claim 71 further comprising means for optic compression of generated raster elements for increasing the brightness and pixel density of a scanning light beam.

57. (Currently amended) A method for forming an image on an image display surface by forming a plurality of constituent blocks of said image, so that the image is presented as comprised of a plurality of blocks, comprising the steps of:

(a) providing at least one complementary screen having a two dimensional array of N pixels and generating from said array of pixels a plurality of raster elements;

(b) using a raster multiplying system comprising an array of optically inter-related light dividing elements arranged so that a first section of said array directly receives light from said complementary screen light and passes another part of the directly received light to another section of said array, dividing the light directly received by said first section of said array and the light passed to said at least one other section of said array into components to form copies of the raster elements, said copies of said raster elements forming corresponding raster element in P blocks, each block of said P blocks generally comprising a two dimensional array of raster element copies;

(c) independently modulating said beam components corresponding to the raster element copies of each of said P blocks;

(d) repeating the procedure of generating other raster elements from said complementary screen; and

(e) displaying the P image blocks having a total number of M pixels on an a single image display surface, where M is greater than N.

58. (Previously presented) A method as in claim 57 further comprising the step of using a plurality of complementary screens.

59. (Previously presented) A method as in claim 57 wherein a raster element comprises more than one pixel.

60. (Previously presented) A method as in claim 59, further comprising the step of subjecting a generated raster element to additional optical compression for increasing the brightness and pixel density of a sensitive plane scanning beam.

61. (Previously presented) A method as in claim 57 wherein a raster element is of the size of only one pixel.

Claims 62-66. Canceled.

67. (Previously presented) A method as in claim 73 wherein a raster element comprises a plurality of pixels.

Claim 68. Canceled.

69. (Currently amended) A 3D holographic image display system comprising:

(a) at least one complementary screen of one of light emitting or light source modulating devices in a two dimensional array of N (a real number) pixels, from which array of pixels a plurality of raster elements are generated;

(b) a raster multiplying system comprising an array of optically inter-related light dividing elements, each said light dividing element to divide the light of said plurality of raster elements of the complementary screen into parts, a first section of said array arranged to directly receive light from said complementary screen, a part of which directly received light is passed to at least one other section of said array, the light directly received by said first section of said array and the light passed to said at least one other section of said array divided into components to form copies of said generated raster elements of a said at least one complementary screen, with said raster element copies forming a raster in P blocks with each block generally comprising a two dimensional array of said raster element copies;

(c) an array of controllable modulators located after said raster multiplying system, each modulator of said array to independently modulate the raster elements of one of said P blocks;

(d) a single surface on which a hologram blocks of total number of M pixels are formed, where the number M exceeds number N and where said surface preceding components of (a), (b) and (c) are placed in the mentioned order of the light path of the complementary screen; and

(e) a coherent light producing means for producing a 3D holographic image from said surface.

Claim 70. Canceled.

71. (Previously presented) A system as in claim 48 used for image recording further comprising:

(e) instead of said image surface a photosensitive plane on which an outer image to be recorded is produced, said outer image comprising a plurality of said blocks, each block being of a two dimensional array of pixels, and all said blocks comprising said M pixels, where the number M exceeds the number N, and where said system components of (a),

(b) and (c) are placed in the mentioned order of the light path of the complementary screen;
and

(f) means to scan said outer image on said photosensitive plane into electric signals for recording.

Claim 72. Canceled.

73. (Previously presented) A method as in claim 57 used for image recording wherein said image display surface of step (e) comprises a photosensitive plane on which an outer image is produced and further comprising that step (b) is followed by:

(f) converting the image information received on said plane by the projection of said beam components into P electric signals, one signal for one of said P blocks, for recording received information for P separate image elements; and

(g) repeating the procedure by successively generating other raster elements on said complementary screen, to simultaneously scan each of P blocks.

Claim 74. Canceled.

75. (Previously presented) A method as in claim 57 further comprising the step of generating a 3D image from said image display surface.

76. (Previously presented) A method as in claim 57 further comprising the step of subjecting raster elements of said complementary screen to additional optical compression for increasing brightness and pixel density.

77. (Previously presented) A system as in claim 48 further comprising means for optic compression of complementary screen raster elements for increasing brightness and pixel density.

78. (Previously presented) A system as in claim 48 further comprising partly transparent mirrors as said light dividing elements.

Claim 79. Canceled.

80. (Previously presented) An image display system as claimed in claim 48 further comprising a light conductor to transmit the light from said complementary screen to the image surface via said raster multiplying system light receiving part.

81. (Previously presented) A method as claimed in claim 57 further comprising using a light conductor to transmit the light from said complementary screen to the image surface via said raster multiplying system light receiving part.



APPENDIX B

EXHIBIT A

LIST OF SOME OF THE USES OF THE TERM "IMAGE PLANE" IN THE SPECIFICATION

PAGE	LINES	LISTING
7	15	The image plane on which the final image of higher resolution is to be formed
7	22	image plane 5 on which the complete image is formed
8	7-8	the sequence of blocks to be displayed on the image display 5
8	12-13	to recite the size of a block to be finally displayed on the image plane 5
8	19	a BDS matrix that adjoins the image plane 5
9	13-14	the total number of pixels obtained on image plane 5
10	3-4	are to be transferred to and displayed on the image pane 5
10	7	to the image plane 5 where the complete image is to be formed
10	7-8	the complete image is displayed in blocks in their proper planes on the image plane 5 through a matrix of BDS elements
10	12	the proper place to display each block on the image plane 5 is selected
10	20-21	the procedure is repeated for forming the entire image on the image plane 5 block by block
11	2-4	that deflect the light from the line onto the image plane 5 to reproduce the block of the image on the image plane
12	2-3	the size of a block of an image to be displayed on the image plane
12	4-5	the matrix element cover the entire image plane surface 5
15	13	display screen 5

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display

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On this page:


Dictionary

display

Or did you mean: [Display Technologies, Inc](#) (NASD: DTEK)

Dictionary



dis·play (dī·splā') 

v., -played, -play·ing,
-plays.

v.tr.

1.
 - a. To present or hold up to view.
 - b. *Computer Science.* To provide (information or graphics) on a screen.
2. To give evidence of; manifest.
3. To exhibit ostentatiously; show off.
4. To be endowed with (an identifiable form or character): *a shrub that displays hardiness.*
5. To express, as by gestures or bodily posture: *a smirk that displayed contempt.*
6. To spread out; unfurl: *The peacock displayed its fan.*

v.intr.

Computer Science. To provide information or graphics on a screen: *a personal computer that displays and prints.*

n.

1.
 - a. The act of

B 1/2

- displaying.
- b. A public exhibition.
- c. Objects or merchandise set out for viewing by the public.
- 2. A demonstration or manifestation: *a display of temper.*
- 3.
 - a. *Biology.* A specialized pattern of behavior used to communicate visually, such as the presentation of colors or plumage by male birds as part of courtship or intimidation.
 - b. An instance of such behavior.
- 4. Ostentatious exhibition.
- 5. An advertisement or headline designed to catch the eye.
- 6.
 - a. *Computer Science.* A video display.
 - b. A visual representation of information.

[Middle English *displayen*, from Anglo-Norman *despleier*, from Medieval Latin *displicāre*, to unfold, from Latin, to scatter : *dis-*, apart; see *dis-* + *plicāre*, to fold.]

SYNONYMS *display*, *array*, *panoply*, *parade*, *pomp*. These nouns denote an impressive or ostentatious exhibition: *a tasteless display of wealth*; *an array of diamond rings*; *a panoply of medals*; *a parade of knowledge and virtue*; *ceremonial pomp*. See also synonyms at *show*.

B2/2

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Thesaurus 
display

verb

1. To make visible;
bring to view: bare,
disclose, expose,
reveal, show,
unclothe, uncover,
unmask, unveil.
Archaic discover.
Idioms: bring to
light, lay open,
make plain. See
show/hide.
2. To make manifest or
apparent:
demonstrate,
evidence, evince,
exhibit, manifest,
proclaim, reveal,
show. See
show/hide.
3. To make a public
and usually
ostentatious show
of: brandish,
disport, exhibit,
expose, flash,
flaunt, parade, show
(off), sport. See
show/hide.
4. To be endowed with
as a visible
characteristic or
form: bear, carry,
exhibit, have,
possess. See
show/hide.
5. To give expression
to, as by gestures,
facial aspects, or
bodily posture:
communicate,
convey, express,
manifest. See
show/hide.

noun

1. An act of showing or
displaying:
demonstration,
exhibit, exhibition,
manifestation,
show. See
show/hide.
2. An impressive or
ostentatious
exhibition: array,
panoply, parade,
pomp, show,
spectacle. See

show/hide.



Computer Desktop Encyclopedia

Technology

display

1. To show text and graphics on a CRT or flat panel screen.
2. A screen or monitor.



WordNet



Note: click on a word meaning below to see its connections and related words.

The noun display has 6 meanings:

Meaning #1: something intended to communicate a particular impression
Synonym: show

Meaning #2: something shown to the public
Synonyms: exhibit, showing

Meaning #3: an electronic device that represents information in visual form

Meaning #4: a visual representation of something
Synonym: presentation

Meaning #5: behavior that makes your feelings public

Meaning #6: exhibiting openly in public view

The verb display has 3 meanings:

Meaning #1: to show, make visible or apparent
Synonyms: expose, exhibit

Meaning #2: make clear and visible
Synonyms: reveal, show

Meaning #3: attract

B-1

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eye

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On this page:
: Dictionary

eye (in anatomy)

Or did you mean: [the Eye](#), [The Eye \(Movie\)](#), [Advanced Medical Optics, Inc. \(NYSE: EYE\)](#), [EYE \(acronym\)](#)

Dictionary

eye (n)



n.

1. An organ of vision or of light sensitivity.
2.
 - a. Either of a pair of hollow structures located in bony sockets of the skull, functioning together or independently, each having a lens capable of focusing incident light on an internal photosensitive retina from which nerve impulses are sent to the brain; the vertebrate organ of vision.
 - b. The external, visible portion of this organ together with its associated structures, especially the eyelids, eyelashes, and eyebrows.
 - c. The pigmented iris of this organ.
3. The faculty of seeing; vision.
4. The ability to make intellectual or aesthetic judgments: *has a good eye for understated fashion.*
5.
 - a. A way of regarding something; a point of view: *To my eye, the decorations are excellent.*
 - b. Attention: *The lavish window display immediately got my eye.*
 - c. Watchful attention or supervision: *always under his boss's eye; kept an eye on her valuables.*
6. Something suggestive of the vertebrate organ of vision, especially:
 - a. An opening in a needle.
 - b. The aperture of a camera.
 - c. A loop, as of metal, rope, or thread.
 - d. A circular marking on a peacock's feather.
 - e. *Chiefly Southern U.S.* The round flat cover over the hole on the top of a wood-burning stove. Also called regionally *cap*, *griddle*.
7. A photosensitive device, such as a photoelectric cell.
8. *Botany.*
 - a. A bud on a twig or tuber: *the eye of a potato.*
 - b. The often differently colored center of the corolla of some flowers.
9.
 - a. *Meteorology.* The circular area of relative calm at the center of a cyclone.
 - b. The center or focal point of attention or action: *right in the eye of the controversy.*
10. *Informal.* A detective, especially a private investigator.
11. A choice center cut of meat, as of beef: *eye of the round.*

tr.v., eyed, eye-ing or ey-ing (ī'ing), eyes.

1. To look at: *eyed the passing crowd with indifference.*
2. To watch closely: *eyed the shark's movements.*
3. To supply with an eye.

idioms:

all eyes

Fully attentive.

an eye for an eye

Punishment in which an offender suffers what the victim has suffered.

clap (or lay or set) (one's) eyes on

To look at.

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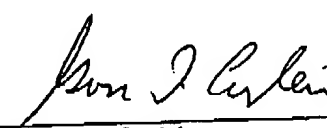


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enlarge)

eye
cross section of a
human eye
(Carolyn Iverson)

e



TRANSMITTAL OF APPEAL BRIEF			Docket No. 00971/000D319-US0	
In re Application of: Anatoly G. Ivanov				
Application No. 08/995,715-Conf. #8165	Filing Date December 22, 1997	Examiner J. A. Brier	Group Art Unit 2672	
Invention: METHODS FOR FORMING/RECORDING IMAGE AND DEVICES FOR SAME				
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Application No. (if known): 08/995,715

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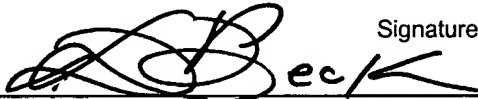
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Appendix B
Exhibit A- 1 Page
Exhibit B - 4 pages
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